THE INTERNATIONAL MARS DATA BASE. S. Slavney[1], R.E. Arvidson[1], E.M. Eliason[2], E. Duxbury[3], and S. K. Lavoie[3], [1]Dept. of Earth and Planetary Sciences, Washington University, St. Louis, MO 63130, [2]U.S. Geological Survey, Astrogeology, 2255 N. Gemini Drive, Flagstaff, AZ 86001, [3]Jet Propulsion Laboratory, 4800 Oak Grove Drive, Pasadena, CA 91109.

The launches of Mars Pathfinder and Mars Global Surveyor in 1996 marked the beginning of a period of renewed interest in the exploration of Mars. These and several other missions planned for the near future will vastly increase the amount of data available to Mars researchers, and will also revive interest in the existing data sets. NASA's Planetary Data System (PDS) is responsible for ensuring that these data are safely archived and made available to the planetary science community and the interested public. As a means toward providing access to the data, the PDS Geosciences Node and Imaging Node are jointly involved in an effort known as the International Mars Data Base (IMDB).

The International Mars Data Base is a set of resources for users of Mars data, all accessed via the World-Wide Web. The IMDB can be found on the Web using the address *http://wundow.wustl.edu/mars/imdb.html*. Figure 1 shows the IMDB capabilities that are currently available as well as those planned for the future. Types of resources include:

- **Links to mission archives, with tools for searching archive databases.** For example, the Mars Navigator allows the user to search a database of Viking Orbiter Experiment Data Record (EDR) images (i.e. raw data) and Mars Digital Image Maps (MDIMs) [1]. Similar mission-specific search tools are planned for Pathfinder and Mars Global Surveyor. Also to be provided are links to databases from international missions, such as the Phobos ISM database at CNES.

- **Cross-mission search capability.** Users can locate data products from multiple Mars missions by searching a set of common parameters such as location and time. This component of the IMDB is planned for FY98.

- **Links to special services.** For example, the Mars Explorer [2] allows the user to construct custom maps of Mars based on the MDIM data set. Other services might include mission timelines, experimenter's notebooks, calibration files, SPICE data, and processing software.

The Mars Navigator, developed jointly by the PDS Geosciences and Imaging Nodes, has been the prototype for an IMDB mission archive tool. The Navigator allows the user to access a Sybase database of Viking Orbiter images and maps derived from them. The user may select images by entering search criteria in a form or by outlining a search area on a map of Mars. Selected images are displayed in the user's Web browser as reduced-size GIF images. The user may download the full-resolution image products or request that they be delivered by FTP or on CD-ROM. Figure 2 shows examples of Mars Navigator Web pages.

The most recent version of the Mars Navigator is implemented using the Java and JavaScript languages. In order to use the full capability of this version of the Navigator it is necessary to use a Java-compatible Web browser, such as Netscape Navigator Gold 3.0. Specifically, the clickable map is implemented as a Java applet which runs on the user's machine rather than across the network, providing a quick visual interface for selecting an area of Mars to be searched. The remainder of the Navigator is implemented with JavaScript using Netscape's LiveWire application environment, which permits a direct connection to the Viking image database. Advantages of using Java, JavaScript and LiveWire are (1) application speed gained by streamlining the interface between the Web and the database, (2) application portability, as Java and JavaScript are available for several computer platforms, and (3) the relative stability of a system based on commercially supported and widely used products, as opposed to a system based on in-house and shareware programming. Future development of the Mars Navigator will include the ability to search for Viking Infrared Thermal Mapper (IRTM) spectral data and Viking Lander image data.

References: [1] Batson, R.M., and E.M. Eliason (1995), Digital maps of Mars, *Photometric Engineering and Remote Sensing*, **61**, 12. [2] Eliason, E.M., P. Garcia, and D. Larsen

IMDB COMPONENTS

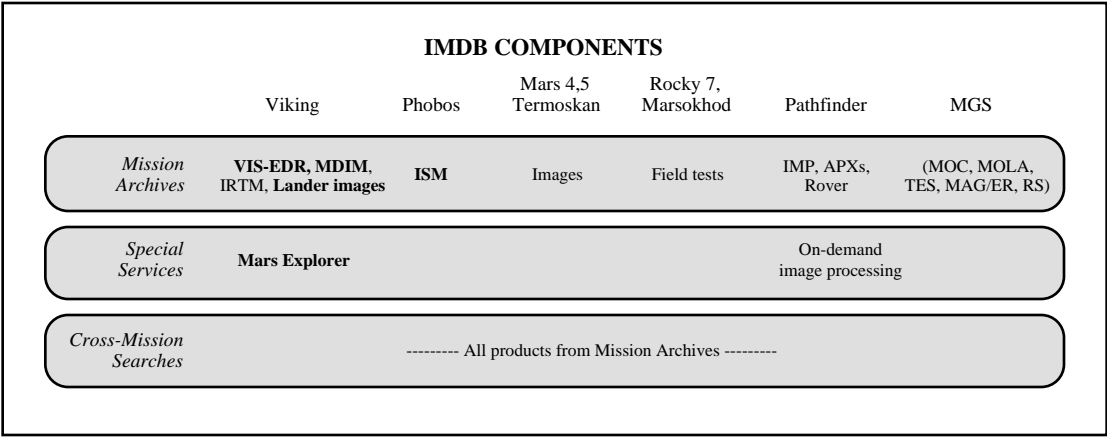|	Viking	Phobos	Mars 4,5 Termoskan	Rocky 7, Marsokhod	Pathfinder	MGS
Mission Archives	**VIS-EDR, MDIM**, IRTM, **Lander images**	**ISM**	Images	Field tests	IMP, APXs, Rover	(MOC, MOLA, TES, MAG/ER, RS)
Special Services	**Mars Explorer**				On-demand image processing	
Cross-Mission Searches	--------- All products from Mission Archives ---------					

Figure 1. The International Mars Data Base (IMDB) includes three types of resources: (1) mission archives, including tools for searching archive databases, (2) special services such as generating custom data products, and (3) searches across multiple missions using common parameters such as location and time. Currently available components are shown in bold; those in progress are shown in plain type, and planned components are in parentheses.

THE INTERNATIONAL MARS DATA BASE: S. Slavney et al.

(1997), The Planetary Data System Mars Explorer, this issue.

(a)

(b)

(c)

(d)

Figure 2. Examples of Mars Navigator World-Wide Web pages are shown. 2a shows one of four forms in which the user can specify search criteria. 2b shows the alternate method of searching the database: outlining an area on a map. The user can also locate named features on the map. 2c shows one of the images found as a result of a search. 2d shows a portion of the order form with which the user can request delivery of data products, either by FTP or on CD-ROM.